WHAT IS CLAIMED

1. Use of a carbon media for storage of hydrogen,
- where the carbon media comprises micro-domain graphitic materials which have been produced by decomposition of hydrocarbons in a reaction chamber connected to a plasma generator in which the hydrocarbons are subjected to a first decomposition step, where the hydrocarbon is fed into the decomposition chamber in the vicinity of the plasma arc zone and mixed with the plasma gas, and where the process parameters are adjusted in such a manner that the hydrocarbons do not reach pyrolysis temperature and are only partially decomposed to form polycyclic aromatic hydrocarbons (PAHs), and
- where the hydrocarbons in the form of PAHs are, after the first decomposition step were mixed with a plasma gas and reintroduced as a part of a plasma gas into a plasma arc zone in a decomposition chamber and subjected to a second decomposition step, where the intense heat in the plasma arc zone caused the PAHs to be converted into the micro-domain graphitic materials.

2. Use of a media according to claim 1, where the micro-domain graphitic materials consists of at least one of the materials chosen from the group comprising carbon nanotubes, fullerenes, carbon micro-cones, and flat graphitic carbon sheets.

3. Use of a media according to claim 2, where the domain size is smaller than 5 μm in diameter or length parallel to the graphitic stacking direction and having a thickness of less than 100 nm in the graphitic stacking direction.

4. Use of a media according to claim 1 - 3, where the media contains micro-domain graphitic materials in the range from close to 0 to above 90wt%.

5. Use of a media according to claim 4, where the media contains more than 90wt% micro-domain graphitic materials.

6. Use of a media according to any one of claims 1-5, where the media results from dehydrogenation of heavy fuel oil into micro-domain graphitic materials.

7. Use of a carbon media for storage of hydrogen comprising micro-domain graphitic materials, where the media contains open carbon micro-cones with total disclination degrees 60° and/or 120°, corresponding to cone angles of respectively 112.9° and/or 83.6°.

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